REMARKS

The Official Action dated February 9, 2005 rejected Claims 1-3 and 5 and Claims 18-28 under 35 U.S.C. §103 as being obvious over WO 00/03859 (translated according to U.S. Patent 6,623,838) (herein "Nomura") in view of U.S. Patent 6,062,624 (herein "Crabtree"). The Applicant appealed, but the Board of Patent Appeals and Interferences ("the Board") affirmed the rejection. (Appeal 2007-0821).

In response to the Office Action and the Decision of the Board, the Applicant has further amended the claims and presented further evidence of patentability. Claim 1 requires polyvinyl chloride ("PVC") in a closed cell form. However, Applicant is not claiming all polyvinyl chloride compositions that have closed cells. Applicant is claiming closed cell polyvinyl chloride with glass fibers as further specified in Claims 1-3 and 5 and Claims 18-28 as presently amended.

Among other differences, Claim 1 as presently amended is patentable over Nomura and Crabtree for the reason that it requires "a polyvinyl chloride [that is] extruded to have internal closed cells" in combination with "glass fibers that are imbedded in the closed cell polyvinyl chloride." For the reasons stated herein and as further evidenced by the declarations of Dr. Jeffery Ryan dated October 12, 2007 ("the Ryan Decl."), Shannon R. Rice dated October 10, 2007 ("the Rice Decl."), and Douglas M. Pennington dated October 12, 2007 ("the Pennington II Decl."), Nomura and Crabtree do not make such a combination unpatentable.

Nomura is directed to moldings for which mechanical and thermal properties are significant. Examples are auto parts, office equipment, housing, furniture and buildings. (Nomura, Col. 1, lines 18-29). Nomura describes prior art moldings that were made according to injection molding, blow molding and expansion cavity techniques. (Nomura, Col. 1, line 60-Col.

3, line 6). The prior art techniques described include filling an expansion cavity mold with a low-foaming thermoplastic resin melt and then injecting a pressure fluid (such as nitrogen) into the mold cavity. (Nomura, Col. 2, lines 33-35). That technique is a two-stage method wherein the mold cavity is enlarged in the first stage and an inert pressure fluid is injected during the second stage. (Nomura, Col. 2, lines 33-42). However, in products formed by the expansion cavity method, an inner cavity or hollow space created in the molding resulted in poor stiffness and strength. (Nomura, Col. 2, lines 58-65). The expansion cavity method also required a relatively large amount of foaming agent which resulted in surface streaks in the molding. (Nomura, Col. 2, line 65 - Col. 3, line 2).

Nomura modifies the prior art expansion cavity process. In Nomura, a mold cavity is filled with a resin melt and a pressure fluid is introduced into the mold cavity while the mold cavity is expanded. (Nomura, Col. 3, lines 36-52). To improve the mechanical strength of the molding, Nomura provides the inner cavity in the molding with a rib structure that spans the inner cavity and strengthens the molding. (Nomura, Col. 5, lines 39-59). As the mold cavity is expanded, the rib is drawn from resin that is stored in recesses in the walls of the mold cavity. (Nomura, Col. 11, lines 1-7).

Claim 1 is patentable over Nomura in that, among other reasons, Claim 1 requires "polyvinyl chloride ... extruded to have internal closed cells" and "glass fibers ... imbedded in the closed cell polyvinyl chloride." Contrary to Claim 1, Nomura produces moldings with an open cell thermoplastic material. The Official Action concedes that Nomura is an open cell thermoplastic material. To overcome that difference, the Official Action proposes to combine Nomura with Crabtree.

The patentable composition of Claim 1 wherein polyvinyl chloride with "internal closed cells" has glass fibers is not made unpatentable by any combination of Nomura with Crabtree. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements: instead there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." (*In re Kahn*, 441 F. 3d 977, 988 (Fed. Cir. 2006) cited with approval in *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007).

Unlike Nomura, which relates to moldings for use in structural applications, Crabtree is directed to a baffle. Crabtree is said to be useful to fill voids in automobile bodies to improve acoustical characteristics and resistance to corrosion. (Crabtree, Col. 1, lines 12-29). Crabtree states that various types of acoustic foaming material can be sandwiched between layers of foil coated craft board. (Crabtree, Col. 3, lines 14-15 and 52-54).

The Office Action states: "Crabtree et al. . . . disclose at Column 3, lines 52-54 that such foams may be either open or closed cell. Thus, it would have been obvious to one of ordinary skill in the art to form the foam of Nomura et al. in either closed or open cellular form since Crabtree et al. teach that either form is effective." (Office Action dated February 9, 2005, p. 2). At issue is whether Nomura and Crabtree properly can be combined in the manner that the Official Action asserts and, if combined, whether they make the claimed invention unpatentable.

PVC can be made in an open cell form and in a closed cell form. Indeed, prior thermoplastic structural members are known to have closed cells as well as open cells. (See Specification 2:20-23). However, that is not to say that closed cell PVC can be uniformly substituted for open cell PVC as the Official Action suggests. There are significant differences between closed cell PVC and open cell PVC.

The Official Action relies on Crabtree to support the broad assertion that the many resins specified therein have either internal closed cells or, alternatively, open cells. However, Crabtree does not support such a notion. Crabtree describes only that, of the many different types of foam cell materials that are listed, some "may be" open cell while others "may be" closed cell. Crabtree states:

> The foaming material we employ may vary widely. The foam material may be open or closed cell. Col. 3, l. 52-53.

One skilled in the art would understand this to mean merely that the thermoplastic material in Crabtree is formed in an uncontrolled process such that some of the cells may be closed and some of the cells may be open. (See Ryan Decl. ¶ 7; Rice Decl. ¶ 11; and Pennington II Decl. ¶ 13).

Crabtree does not teach that closed cell resins are interchangeable with open cell resins. Nothing in Crabtree describes or suggests how or why a closed cell foaming material that is used for acoustic purposes properly can be substituted for the thermoplastic resin of Nomura which specifically requires an open cell structure to allow injected gas to disperse throughout the molding. (Pennington II Decl. ¶ 13; Rice Decl. ¶¶ 12, 13; Ryan Decl. ¶ 13). Nothing in either Nomura or Crabtree suggests to one skilled in the art that those two patents could be combined or how such a combination could be used to modify Nomura and cause Nomura to produce a closed cell thermoplastic material. (Ryan Decl. ¶ 9; Pennington II Decl. ¶¶ 14, 15; Rice Decl. ¶¶ 12, 13)).

The claimed invention is not an adaptation of what is disclosed in either Nomura or Crabtree. To the contrary, the processes of preparation for each reference are vastly different and the Official Action offers no explicit analysis of why the disclosures of Nomura and

Crabtree should be combined. See *Ex parte* ERKEY et al. , Appeal 2007-1375 p. 8 (BPAI May 11, 2007). Moreover, Nomura and Crabtree are directed to various thermoplastic resins that are prepared by methods that are totally different from the method described in the subject application. The Rice, Ryan and Pennington II Declarations make clear that a combination of Nomura and Crabtree is neither common nor commonly understood in the art. (See Ryan Decl. ¶¶ 8-9, Rice Decl. ¶¶ 11-12 and Pennington II Decl. ¶¶ 13-15). Merely stating that both references "are useful in car parts such as in panel cores" is not a sufficient reason for modifying the open cells of Nomura to have closed cells. The mere possibility that the structures of both Nomura and Crabtree might be found on an automobile is in no way sufficient to support the proposed combination of those references.

There is no legally sufficient basis for combining the teachings of Nomura and Crabtree. The Patent Office is required to provide sufficient evidence to show that one having ordinary skill in the art would have done what the Applicant did. *United States v. Adams*, 383 U.S. 39, 52 148 USPQ 479, 483-84 (1966); *In re Kahn*, 441 F.3d 977, 987-88, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) See *Ex parte* CRAWFORD et al. Appeal 2006-2429, p. 8. (BPAI, May 30, 2007).

There is no suggestion or motivation to combine Nomura and Crabtree. (See Rice Decl. ¶ 12). Motivation to combine references "may be found in implicit factors, such as 'knowledge of one of ordinary skill in the art, and [what] the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art'." *Alza Corp. v. Mylan Labs.*, 464 F.3d 1286, 1291, 80 USPQ2d 1001, 1004 (Fed. Cir. 2006) (quoting *In re Kahn*, 441 F.3d 977) See *Ex parte* KUBIN et al., Appeal 2007-0819 p. 9 (BPAI May 31, 2007). However, such implicating factors do not support the combination of Nomura and Crabtree. (Rice Decl. ¶¶ 11-13, Ryan Decl. ¶¶ 8-10, Pennington II Decl. ¶¶ 13-16).

Nothing in either reference suggests that one skilled in the art would suppose that selected portions of the acoustical member in Crabtree could be substituted into the structural member of Nomura. On the contrary, that assertion is directly contrary to the evidence of record that one skilled in the art would not know now to combine Crabtree with Nomura so as to produce the closed cell polyvinyl chloride with glass fibers as claimed. (See Ryan Decl. ¶ 8,9 and 10, Rice Decl. ¶ 12 and 13 and Pennington II Decl ¶ 13-19).

The Official Action's bare assertions of "ordinary skill in the art" cannot bridge the gaps between Nomura and Crabtree. Imbuing one of ordinary skill in the art with the knowledge of the invention at issue in the absence of art that conveys or suggests such knowledge is to fall victim to hindsight reconstruction. *Al-Site Corp. v. VSI Int'l, Inc.*, 174 F.3d 1308 (Fed. Cir. 1999). Nomura would not lead one skilled in the art to attempt to modify that composition to have closed cell polyvinyl chloride with imbedded fibers. Nomura teaches a molding having an open cell structure. The use of closed cells is directly opposed to the teachings of Nomura. Closed cell polyvinyl chloride with imbedded glass fibers as required by Claim 1 remains unknown from Nomura. Missing suggestions cannot be supplied merely by reference to "ordinary skill in the art." Thus, Nomura leads one skilled in the art to use an open cell material and does not suggest any combination with Crabtree.

Even if Nomura and Crabtree could be properly combined, nothing in either reference supports the conclusion that a mechanism for such combination is known or that the results are predictable. In fact, all evidence is completely to the contrary! Crabtree does not teach how to control any processes so as to selectively create closed cells in a thermoplastic material. (Rice. Decl. ¶ 11). Crabtree does not teach one skilled in the art how to modify Nomura so that Nomura could produce a closed cell polyvinyl chloride compound with glass fibers. (Ryan Decl.

¶ 8 and 9; Rice Decl. ¶ 12). No teaching of Crabtree can modify Nomura to result in a closed cell thermoplastic molding because the expansion cavity mold process in Nomura will not produce a closed cell thermoplastic material. (Rice Decl. ¶ 12; Pennington Decl. II ¶ 18; Ryan Decl. ¶¶ 8-9).

In contrast to Claim 1, Nomura teaches away from closed cell polymer materials! Whether a reference teaches away from a claimed invention is a question of fact. In re Mayne, 104 F.3d 1339, 1343, 41 USPQ2d 1451, 1455 (Fed. Cir. 1997). [I]n general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. In re Gurley, 27 F.3d 551, 31 USPQ2d 1130 (Fed. Cir. 1994).

In contrast to Nomura, Claim 1 specifies thermoplastic resin that has "internal closed cells." Nomura does not describe or suggest the use of a PVC polymer material having "internal closed cells." Instead, Nomura describes a molding of gas-permeable walls that are specified to have "an open cellular structure." (Nomura, Col. 8, lines 63-68). Open-cell PVC structures are mechanically weaker than PVC closed-cell structures. (Pennington II Decl. ¶¶ 11 and 12). Nomura purports to overcome the problem of mechanical weakness in the molding by providing an internal rib in the hollow area of the molding. (Pennington Decl. II ¶ 17). Even if, contrary to the Ryan, Rice and Pennington II Declarations, Crabtree could be used to modify Nomura, Nomura teaches using an internal rib, not closed cells, to strengthen the molding. The use of internal ribs negates any motivation to strengthen the molding by use of closed cell thermoplastic material. (Pennington Decl. II ¶ 18). Thus, the line of development in Nomura suggests the continued use of open cell thermoplastic material and leads away from the use of closed cell thermoplastic compounds. (Pennington Decl. II ¶ 18)

It is improper to substitute the closed cell acoustic material of Crabtree for the open cell structural material of Nomura when Nomura expressly teaches that an open cell composition is to be used! A determination of obviousness must involve more than indiscriminately combining prior art. *Micro Chem., Inc. v. Great Plains Chem. Co., Inc.*, 103 F.3d 1538, 1546 (Fed. Cir. 1997), cert. denied, 117 S. Ct. 2516 (1997). Nothing in Nomura or Crabtree suggests a purpose or a benefit in substituting a polyvinyl material having closed cells into Nomura which specifically requires an open cell structure. Crabtree does not teach that closed cell foaming materials are interchangeable with open cell foaming materials. No teaching of Crabtree supports selectively ignoring Nomura's instruction to use an open cell material. The use of a structuctual material composed of closed cell polymer material with glass fibers can be gathered only from the Applicant's own teachings. Claim 1 cannot be made unpatentable by modifying or combining Nomura and Crabtree in accordance with the Applicant's own teachings.

The rejection proposed by the Official Action is necessarily based on the Applicant's own teachings and not the teachings of Nomura and Crabtree. What may have been within the knowledge of one skilled in the art is insufficient absent evidence that one of ordinary skill in the art actually possessed such knowledge. *Smiths Indus. Med. Sys., Inc.*, 183 F.3d 1347, 1356 (Fed. Cir. 1999). The Ryan, Rice and Pennington II declarations clearly demonstrate that the closed cell and open cell polyvinyl chloride are not known to be freely interchangeable.

Nomura discloses an open cell thermoplastic polymer material that has glass fibers. Crabtree is directed to an acoustic material that does not even have imbedded glass fibers. Based on the evidence of record, at the time the invention was made, it was not obvious to the normally skilled artisan to combine an open cell structural material with a closed cell acoustic material against the teaching of the references. (See Rice Decl. ¶¶ 10-13, Ryan Decl. ¶¶ 8-10 and

Pennington II Decl. ¶¶ 13, 15, 19). Accordingly, Claim 1 is patentable over the Nomura and Crabtree references.

Claims 2-3 and 5

Claims 2 –3 and 5 are dependent on Claim 1 and incorporate all the limitations thereof. Accordingly, among other reasons, Claims 2-3 and 5 are patentable for the same reasons as stated for Claim 1.

Claim 18

Claim 18 is patentable over Nomura and Crabtree in that, among other reasons, Claim 18 requires "a polyvinyl chloride resin having closed voids" in combination with "glass fibers that are imbedded [in the closed void polyvinyl chloride resin]". As discussed previously with respect to Claim 1, Nomura does not suggest that the polyvinyl material should have closed voids. In fact, the teachings of Nomura are exactly the opposite! Nomura states that the cells produced according to the process therein described are "open" cells and that the porosity derives from air permeable pores that do not have a macroscopically detectable, definite hollow area. (Nomura, Col. 8, lines 63-68; Col. 15, lines 53-57).

For the reasons previously discussed with respect to Claim 1, nothing in Nomura or Crabtree makes Claim 18 unpatentable. As previously explained with respect to Claim 1, the cited references actually lead away from the subject invention and evidence patentability!

Claims 19-28

Claims 19-28 are dependent on Claim 18 and incorporate all the limitations thereof. Accordingly, among other reasons, Claims 19-28 are patentable for the same reasons as stated for Claim 18.

In accordance with the forgoing, Claims 1-3, 5 and 18-28 are in condition for allowance. The Applicant respectfully requests allowance of Claims 1-3, 5 and 18-28.

The Commissioner is hereby authorized to charge Deposit Account No. 03-2026 for any fees associated with this Amendment.

Respectfully submitted,

By: _____

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